COMMONWEALTH OF KENTUCKY

WASTE TIRE MARKET DEVELOPMENT
CRUMB RUBBER GRANT PROGRAM

Division of Waste Management

Energy and Environment Cabinet

KENTUCKY WASTE TIRE CRUMB RUBBER GRANT PROGRAM

ATHLETIC FIELDS

Advantages of Crumb Rubber

Research by Michigan State University has shown good results for football and soccer fields along with golf course cart paths. See http://www.css.msu.edu/home/rp-topdress.html for more information. The area in front of the soccer goals and the midfield area normally wear down over the season, as does the area between the hash marks on a football field. Adding sand decreases muddiness, but it cuts the crown of the grass making the turf wear problem worse. Adding a three-fourth inch thickness of crumb rubber, in three applications of one-fourth inch thickness, improves turf survivability. The crumb rubber size should be between 10/20-mesh and one-fourth inch. EPPC recommends about one-half of the smaller size and one-half of the larger. Crumb rubber has the following advantages:

- Does not damage the crown tissue
- Lowers impact adsorption which increases turf life and may reduce injuries
- Increases heat retention, which leads to earlier and later growing seasons, which is especially important for Bermuda grass fields.
- Increases the number of events from about 60 per year for a normal grass field to about 100 for a crumb-rubber treated area (North Kingstown High School, North Kingstown, Rhode Island cost analyses)
- Saves or delays some turf re-establishment costs.

The 10/20-mesh size costs more but works into the turf more quickly, providing faster results. Too much of the small particles may change the soil structure. The ¼ inch takes longer to work into the turf but does not change the soil.

The use of crumb rubber is not a replacement for normal turf maintenance. You must re-establish mature turf on bare spots before spreading the crumb product. You are also responsible for providing the normal funding for yearly upkeep.

QUESTIONS & ANSWERS

QUESTION: Why apply crumb rubber to athletic fields?

ANSWER: Studies by Michigan State University show improved turf durability when crumb rubber is spread on athletic fields. Many caretakers have used sand on playing surfaces, but sand is angular and cuts into the crown of the grass. Rubber is rounded and does not cut the grass. As it works into the top of the soil, it:

- Promotes continuous aeration,
- Retains moisture,
- Attracts some warmth to extend the growing season; and
- Reduces the need to annually reestablish grass, potentially saving money and lost playing time.

QUESTION: What is crumb rubber?

ANSWER: It is waste tires ground into small particles approximately ¼ inch or smaller.

QUESTION: How much does crumb rubber cost?

ANSWER: It is approximately $0.20 per pound or $400 per ton.

QUESTION: How much is needed for one field?

ANSWER: An entire football field needs 30 tons for Bermuda fields costing about $12,000 and Fescue or Bluegrass fields needs about 45 tons costing about $18,000. A large soccer field needs 45 tons for a Bermuda field costing about $18,000 or 60 tons for Fescue or Bluegrass fields costing about $24,000. This is equivalent to 8,000-12,500 waste tires per field.

QUESTION: How is the crumb rubber applied?

ANSWER: Usually three applications of 1/4 inch deep, or two of 3/8 inches, separated by enough time to allow the first application to settle. You should allow at least a week to pass between applications.

QUESTION: Is labor cost included in the purchase price of crumb rubber?

ANSWER: No. Labor may be performed by the entity purchasing the crumb rubber, if proper equipment is available.

QUESTION: Does the entire field need crumb rubber application?

ANSWER: Not necessarily. Highlighting the areas of heaviest play may suffice. For football fields, this area is from 20-yard line to 20-yard line between the hash marks. For soccer, the high-traffic area is in front of both goals and the center circle. This saves about one-half the cost. For combination football/soccer fields, one could apply crumb from end line to end line, between the hash marks, saving about one-third the costs.

QUESTION: Does crumb rubber reduce injuries on athletics fields?

ANSWER: Some schools say it does. MSU says it increases impact absorption.

QUESTION: Is replacement of crumb rubber necessary?

ANSWER: Occasional. 1/8-inch deep applications are necessary to maintain the advantageous properties. The applicant would be responsible for this cost.

QUESTION: Do the players track the material all over the place and is it hazardous to them in any way?

ANSWER: It is possible for players to track crumb rubber off the field and it may get into clothing and equipment. However, the material is inert and will cause no harmful health affects. With mature grass coverage, the crumb rubber is barely visible and is less likely to attach to shoes.

QUESTION: Will the crumb rubber catch on fire?

ANSWER: No. Crumb rubber is spread like fertilizer and the soil absorbs it. Crumb rubber infiltrates into the mature grass cover.

QUESTION: Are there harmful environmental affects?

ANSWER: Not according to recent studies. MSU says “The major constituents of rubber are iron, sulfur, and zinc. While iron and zinc levels have increased in our tests, none have approached levels of concern nor do these elements pose concerns to the water quality. At no time have we seen any toxicity to the turfgrass plant during our studies.”

QUESTION: Is crumb rubber helpful to other similar applications?

ANSWER: Yes. Golf course owners use it on cart paths and the Louisville Riverbats baseball club uses it on their field.

QUESTION: Is crumb rubber application a replacement for good turf management?

ANSWER: No. Normal turf management must including reseeding, application of fertilizer, herbicides and pesticides.

QUESTION: Can crumb rubber be applied to bare ground with the same results?

ANSWER: No. There must be a good stand (90%) of turf before applying crumb rubber.

Crumb rubber on athletic fields increases rebound, helps protect the grass, and may reduce injuries.”

KENTUCKY WASTE TIRE CRUMB RUBBER GRANT PROGRAM

MATERIAL DETAIL

Contractor: If using a top-dressing contractor, such as Turf Solutions, JaiTire or a similar company, they may furnish the calculations for the material in their bid or estimate document. ***(The mention of the example contractor's name is not an endorsement).***

Source: Kentucky waste tires would be the source of the crumb rubber and the proposed tracking system. Kentucky law requires a receipt from tire store to transporter to processor. The supplier should provide a summary of the receipts stating the source of the tires.

Quality: The size of crumb rubber may be as small as 10/20 mesh or as large as ¼ inch crumb rubber.

Quantity: Crumb rubber top dressed at 0.50 to 0.75 inch levels (1,200 to 1,800 lbs/1,000 SF) will increase turf grass wear tolerance and prevent soil compaction in turf grass maintained above 0.63 inch (MSU study).

Cost: Call several crumb rubber producers. For example, if the quoted price is 20 cents per pound delivered, the total crumb rubber costs would be 120,000 lbs. X $0.20 = $24,000.

PROMOTION DETAIL

Here are some pertinent facts about crumb rubber.

- The purpose of crumb rubber is to recycle waste tires while extending turf life, improving field quality, and possibly reduce the number of injuries;

- Research by Michigan State University shows increased impact adsorption values that should protect the crown tissue of the grass from damage, unlike sand, which is sharp. The increased "bounciness" and decreased bare spots should also help reduce injuries.

- The project will help find uses for tires in abandoned scrap tire piles that are breeding grounds for the Asian tiger and Eastern treehole mosquito, which carry infectious and equine encephalitis as well as the Nile Virus (see the Cabinet for Health Services Web site for the latest West Nile Virus information: http://chs.ky.gov/publichealth/west_nile_virus.htm)

- Disposal of whole tires in landfills is banned because they 'float' to the top and interfere with heavy equipment that is compacting the trash or placing the final cap.

- Americans generated 299 million scrap tires in 2005, or about one tire per person, and reused 259 million, or 87% according to the Rubber Manufacturers' Association. See https://www.rma.org/scrap_tires/scrap_tire_markets/ and click on US Scrap Tire Markets 2005 Report.

KENTUCKY WASTE TIRE CRUMB RUBBER GRANT PROGRAM

- Kentuckians generate about 4 million scrap tires per year and reuse about 3 million per year, mostly as tire derived fuel and landfill liner protection. This project is part of a state effort to create higher-use waste tire markets.

- The General Assembly created the $1.00 per tire fee in 1998 and reauthorized it in 2006. It will sunset in 2010. (The fee does not include tire disposal costs). The Environmental and Public Protection Cabinet (EPPC) oversees this program. The fee has paid for the clean up of 14 million waste tires abandoned in piles or delivered by citizens to amnesty programs. Today, there are no major stockpiles remaining. The EPPC now focuses its major efforts on future scrap tire market development